

Remarks

This is in response to the final Office Action mailed December 28, 2007, in the above-referenced application.

Claims 22, 24, 49 and 50 are rejected under 35 USC Section 103(a) as obvious over M. Pradetto (DE 3837506) in view of Martin *et al.* (US Patent No. 4,579,080). Applicants respectfully traverse this rejection.

The susceptor of the claimed system is defined by a plurality of straight sidewall sections connected at adjacent sides, each section having a planar surface, such as the plurality of adjacent straight side wall sections 51 of Figure 6. The susceptor further includes a plurality of wafer pockets, such as wafer pockets 52 of Figure 6, on the inner circumference thereof.

As stated in the application as filed, the susceptor illustrated in Figure 6 is most appropriately used in the type of system illustrated in Figure 2. As illustrated in Figure 2, the source of electromagnetic radiation external to the reaction vessel is spaced apart from the reaction vessel to form a void or space therebetween. As also illustrated in Figure 2, the system can further include a water inlet for introducing water into the space between the reaction vessel and the source of electromagnetic radiation to form a water jacket to circulate water against an outer surface of the reaction vessel.

The Examiner acknowledges that Pradetto does not teach a system as claimed which includes a water inlet for introducing water into the space between the reaction vessel and the source of electromagnetic radiation to form a water jacket to circulate water against an outer surface of the reaction vessel. Applicants respectfully submit that Pradetto not only does not teach such a system; when read in its entirety for all that it fairly teaches, Pradetto teaches away from the use of such a system. *See* pages 2-3 of the English translation of Pradetto submitted with the Information Disclosure Statement filed with Applicant's Response of November 9, 2007.

Here, Pradetto discusses the problems associated with systems that rely on reflected radiation, including systems with a susceptor supporting wafers on an outer surface thereof located within a quartz bell. Pradetto identifies as one problem the requirement of cooling the interior surface of the bell. Other problems include the requirement of a reflective coating on the quartz bell or shields arranged around the bell to reflect radiation emitted by the wafers back onto the wafers. Thus, Pradetto teaches away from the use of such systems.

Martin cannot overcome the deficiencies of Pradetto. Martin is directed to a system of the type criticized by Pradetto, *i.e.*, one that includes a susceptor with wafers on an outer surface located within a quartz bell with a reflective coating for reflective heating of the wafers and that requires cooling.

In addition, the Pradetto and Martin systems are functional and structural opposites of one another. Because the Pradetto and the Martin systems are structural and functional opposites, the documents teach away from various operational aspects of one another, and thus the cited documents are not properly combinable.

Accordingly, Applicants respectfully request withdrawal of this rejection.

Claims 22, 24, 49 and 50 are rejected under 35 USC Section 103(a) as obvious over Martin *et al.* (US Patent No. 4,579,080) in view of M. Pradetto (DE 3837506). Applicants respectfully traverse this rejection as well.

As noted above, Martin is directed to a system including a susceptor with wafers on an outer surface located within a quartz bell with a reflective coating for reflective heating of the wafers. Inasmuch as Martin relies on reflective heating, the wafers necessarily must be placed on the outer surface of the susceptor. In contrast, Pradetto is directed to a system which is the functional and structural opposite of the Martin system. Accordingly, as also noted above, the documents teach away from various operational aspects of one another, and thus the cited documents are not properly combinable. Further, the proposed modification would change the principle of operation of the Martin system, which relies upon reflective heating of wafers located on an outer surface of the susceptor. In addition, as noted above,

Pradetto criticizes and teaches away from the use of a system such as the Martin system. Accordingly, Applicants respectfully request withdrawal of this rejection as well.

Claims 22, 24, 49 and 50 are rejected under 35 USC Section 103(a) as obvious over Briody (US Patent No. 3,659,552) in view of Ryoze Sato (JP 64025541) and further in view of Martin *et al.* (US Patent No. 4,579,080). Applicants respectfully traverse this rejection.

The Briody apparatus does not include a susceptor “defined by a plurality of straight sidewall sections, each section having a planar surface” as claimed. In contrast, the Briody apparatus includes a hollow drum-like work holder 16 formed of a plurality of annular members, such as graphite rings 15-15. Column 2, lines 40-46. As illustrated in Figure 1, the plurality of rings 15 form curved side walls in a ringed drum configuration. See also Figure 2, illustrating the curved surface of a section of a ring 15.

Briody also does not teach spacing between facing planar sidewall sections as claimed. Briody certainly does not teach or recognize that appropriately dimensioned spacing can function as claimed to “heat the exposed surface of a facing substrate wafer to substantially the same temperature as said susceptor portion heats a substrate wafer that is in one of said wafer pockets to thereby minimize or substantially eliminate radial and axial temperature gradients across a substrate wafer.”

Applicants respectfully submit that Sato cannot overcome the deficiencies of Briody. In contrast to the claimed invention, in which spacing between facing sidewall sections is unobstructed, the Sato apparatus includes a centrally located cooling tube 16 and an annular wafer supporting body 18 arranged so as to surround the cooling tube, *i.e.*, the cooling tube 16 obstructs opposing surfaces of the annular wafer supporting body 18.

Also in contrast to the claimed invention in which the spacing between facing sidewall sections is dimensioned so that facing sidewall sections radiantly and directly heat the exposed surface of a facing substrate wafer, in Sato, reaction gas is guided between the cooling tube 16 and a wafer mounting surface 18a of the supporting body 18 so as to cool the

reaction gas and suppress an increase in temperature. Accordingly, Sato teaches away from the combination proposed by the Examiner.

The Examiner acknowledges that neither Briody nor Sato teach a system as claimed which includes a water inlet for introducing water into the space between the reaction vessel and the source of electromagnetic radiation to form a water jacket to circulate water against an outer surface of the reaction vessel. Applicants respectfully submit that Martin cannot overcome the deficiencies of Briody and Sato.

As noted above, Martin is directed to a system including a susceptor with wafers on an outer surface thereof located within a quartz bell with a reflective coating for reflective heating of the wafers. Inasmuch as Martin relies on reflective heating, the wafers necessarily must be placed on the outer surface of the susceptor. Thus, the Briody and Sato systems are functional and structural opposites of the Martin system. Because the systems are structural and functional opposites, the documents teach away from various operational aspects of one another, and thus the cited documents are not properly combinable.

Even if one were to consider combining the teachings of Briody, Sato and Martin (which Applicants respectfully submit the skilled artisan would not do), the skilled artisan would at best incorporate a centrally located cooling tube, such as disclosed in Sato, in the Briody system, and not the cooling system of Martin (which system is, as noted herein, the structural and functional opposite of the Briody and Sato systems). Accordingly, Applicants respectfully request withdrawal of this rejection.

Claims 22, 24, 49, and 50 are rejected under 35 USC Section 103(a) as obvious over Briody (US Patent No. 3,659,552) in view of Kobayashi *et al.* (JP 62257720) and further in view of Martin *et al.* (US Patent No. 4,579,080). Applicants respectfully traverse this rejection.

As noted above, the Briody apparatus does not include a susceptor “defined by a plurality of straight sidewall sections, each section having a planar surface” as claimed. In contrast to the claimed invention, the Briody apparatus includes a hollow drum-like work

holder 16 formed of a plurality of annular members, such as graphite rings 15-15. Column 2, lines 40-46. As illustrated in Figure 1, the plurality of rings 15 form curved side walls in a ringed drum configuration. See also Figure 2, illustrating the curved surface of a section of a ring 15.

Further, as discussed above, Briody does not teach spacing between facing planar sidewall sections as claimed. Briody certainly does not teach or recognize that appropriately dimensioned spacing can function as claimed to “heat the exposed surface of a facing substrate wafer to substantially the same temperature as said susceptor portion heats a substrate wafer that is in one of said wafer pockets to thereby minimize or substantially eliminate radial and axial temperature gradients across a substrate wafer.”

Applicants respectfully submit that Kobayashi cannot overcome the deficiencies of Briody. Similar to Briody, Kobayashi also does not illustrate a susceptor “defined by a plurality of straight sidewall sections, each section having a planar surface” as claimed. Rather, in contrast to the claimed invention, Figure 2 of Kobayashi illustrates another annular ring like member with curved walls as the supporter 14, which is similar to the graphite rings 15-15 of Briody. Thus, even if one were to combine the teachings of the cited documents as proposed by the Examiner, the result would not be the same as claimed.

The Examiner also acknowledges that neither Briody nor Kobayashi teach a system as claimed which includes a water inlet for introducing water into the space between the reaction vessel and the source of electromagnetic radiation to form a water jacket to circulate water against an outer surface of the reaction vessel. Applicants respectfully submit that Martin cannot overcome the deficiencies of Briody and Kobayashi.

As noted above, Martin is directed to a system including a susceptor with wafers on an outer surface thereof located within a quartz bell with a reflective coating for reflective heating of the wafers. Inasmuch as Martin relies on reflective heating, the wafers necessarily must be placed on the outer surface of the susceptor. Thus, the Briody and Kobayashi systems are functional and structural opposites of the Martin system. Because the systems

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are structural and functional opposites, the documents teach away from various operational aspects of one another, and thus the cited documents are not properly combinable. Accordingly, Applicants respectfully request withdrawal of this rejection.

The rejections of record having been addressed in full in the foregoing, Applicants respectfully submit that the present application is in condition for allowance, which action is respectfully solicited. Should the Examiner have any questions regarding the foregoing, it is respectfully requested that the Examiner contact the undersigned at his convenience to expedite examination and allowance of this matter.

It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 50-0332.

Respectfully submitted,

/Melissa B. Pendleton/

Melissa B. Pendleton
Reg. No. 35,459

021176
Summa, Allan & Additon, P.A.
11610 North Community House Road, Suite 200
Charlotte, NC 29277-2162
Telephone: 704/945-6700
Facsimile: 704/945-6735
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